Volunteer Lake Assessment Program Individual Lake Reports

WICWAS LAKE, MEREDITH, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	5,312	**Max. Depth (m):**	10.9	**Flushing Rate (yr^{-1}):**	2
Surface Area (Ac.):	328	**Mean Depth (m):**	3.9	**P Retention Coef:**	0.58
Shore Length (m):	9,500	**Volume (m^3):**	5,110,500	**Elevation (ft):**	502

TROPHIC CLASSIFICATION

Year	Trophic class
2009	MESOTROPHIC
2009	MESOTROPHIC

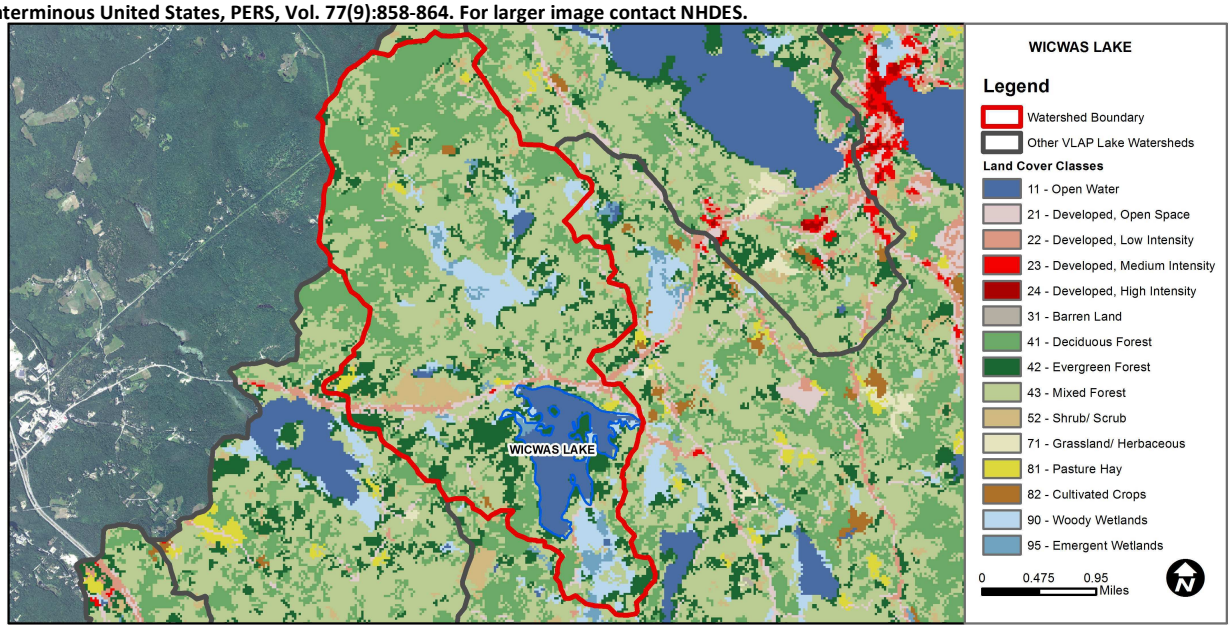
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

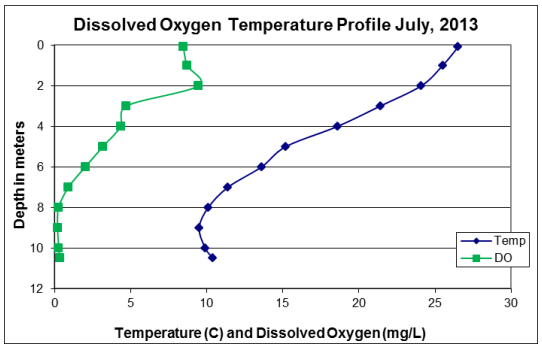


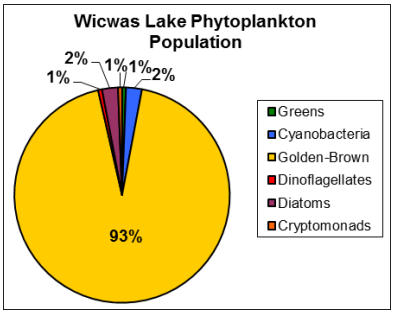
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	6.47	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	1.73	Deciduous Forest	26.65	Pasture Hay	0.59
Developed-Low Intensity	0.92	Evergreen Forest	12.49	Cultivated Crops	0.24
Developed-Medium Intensity	0.02	Mixed Forest	39.88	Woody Wetlands	6.75
Developed-High Intensity	0	Shrub-Scrub	2.66	Emergent Wetlands	1.57

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
WICWAS LAKE, MEREDITH, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were elevated in July, much greater than the state median, and phytoplankton data indicate Golden-Brown algae were abundant. Historical trend analysis indicates relatively stable chlorophyll with moderate variability between years.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity levels were average for most NH lakes and slightly greater than the state median. Spring chloride monitoring indicates elevated chloride in Chemung Wetland and North Culvert likely due to road salting. However, historical trend analysis indicates significantly decreasing (improving) epilimnetic conductivity since monitoring began. We hope to see this continue!
- **E. COLI:** E. coli levels were very low and much less than state standards for public beaches and surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were low in July and less than the state median. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Metalimnetic and hypolimnetic phosphorus levels were within an average range. Tributary and Cove phosphorus levels were low.
- **TRANSPARENCY:** Transparency was much lower than normal due to the elevated algal concentrations. Historical trend analysis indicates relatively stable transparency with moderate variability between years.
- **TURBIDITY:** Epilimnetic, metalimnetic, tributary and cove turbidity were low. Hypolimnetic turbidity was slightly elevated.
- **PH:** Metalimnetic and hypolimnetic pH levels were less than desirable range 6.5 – 8.0 units. Historical trend analysis indicates relatively stable epilimnetic pH with high variability between years.
- **RECOMMENDED ACTIONS:** The improving epilimnetic conductivity trend is encouraging; however Chemung Wetland and North Culvert chloride levels were elevated. Encourage local road agents and winter maintenance companies to obtain a NH Voluntary Salt Applicator license through the UNH Technology Transfer Center's Green SnowPro Certification. Increase monitoring frequency to three times per summer, typically June, July and August, to better assess seasonal water quality and historical trends and decrease data variability. Significant early summer storm events and nutrient loading from stormwater runoff may have caused the increase in algal growth in July. The increased frequency and intensity of storm events highlights the importance of managing stormwater runoff in the watershed. DES' "Homeowner's Guide to Stormwater Management" is a great resource.





NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m

Table 1. 2013 Average Water Quality Data for WICWAS LAKE

Station	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Blake Brook			18							
Chemung Wetland			180							
East Cove				56.1	10	5			0.27	6.83
Epilimnion	5.80	10.63	9	55.5		7	2.60	2.90	0.48	6.78
Metalimnion				58.0		12			0.79	6.09
Hypolimnion				61.0		17			2.60	6.03
Launch Ramp				56.6	10	3			0.26	6.83
North Culvert			45							
Outlet			12							
Rte 104 Inlet			9	56.0	10	6			0.45	6.83
West Cove			9	56.3	10	3			0.34	6.87

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
Conductivity	Improving	Data significantly decreasing.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.